Avaya Solution & Interoperability Test Lab

Connecting Avaya 4600 Series IP Telephones and AvayaWireless Access Points with the Avaya C460 Converged Multilayer Switch using Power over Ethernet (PoE) - Issue 1.0

Abstract

These Application Notes describe how to configure inline power for Avaya 4600 Series IP Telephones and Avaya Wireless Access Points with the Avaya C460 Converged Multilayer Switch. The various Avaya powering arrangements are shown and the administration commands for displaying and controlling the powering status of the switch ports are demonstrated.

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1. Introduction

Power over Ethernet (PoE) is a feature offered on several Ethernet switches. It allows the switch to supply power to a network device within the same CAT-5 cable that carries the Ethernet signaling. This simplifies network installation and powering design, removing the need for a separate power supply for each IP telephone in the network. IEEE 802.3af defines a standard protocol to be used by powering and powered devices. Avaya 4600 Series IP telephones, Avaya wireless LAN access point products, and the Avaya C460 Converged Multilayer Switch comply with this standard.

The Avaya C460 Switch Release 2.0 introduces new PoE I/O modules and a 1000 W Power Supply Unit (PSU) to support PoE. The Avaya C460 Switch can support up to 4 slots with PoE modules and 3 1000W PSUs to support PoE. The PoE module provides power feeding for up to 48 Fast Ethernet ports with up to 15.4 Watts with 48V per port over Category 3, 5, or 6 cabling. The two new PoE modules are:

- M4638ML-T-PWR – C460 Multilayer 48 X 10/100 BaseT (RJ-45) inline power module
- M4638ML-T-2G-PWR – C460 Multilayer 48 X 10/100 BaseT (RJ-45) + 2 x GBIC (SFP) inline power module

The Avaya product configurations addressed by these Application Notes are shown in **Figure 1**. The following Avaya products are directly connected to the switch:

- 4602 and 4602SW IP Telephones
- Gen-2 4606, 4612 and 4624 IP Telephones
- 4620 IP Telephone (including the optional EU24 Button Expansion Module)
- 4630SW IP Screenphone
- AP-3 (v2 model), AP-4 and AP-5 Access Points.

Note that only version 2 AP-3 models support PoE interface. A visual indicator to tell a "v1" vs. "v2" AP-3 is that the "v1" has a mini-din serial connector and the "v2" has a male DB9 serial connector. Version 1 AP-3 models will not work with the C460 PoE module.

The Gen-1 Avaya™ 4612 and 4624 IP Telephones require the Avaya™ 30A Switch Base. **Figure 2** shows the connections for the 30A switch base. The 4612 and 4624 telephones can be identified as Gen-1 or Gen-2 by inspecting the model number. "1A" in the model number indicates Gen-1; "2A" indicates Gen-2. The model number can be found by:

- Inspecting the label attached to the bottom of the telephone.

OR

- Pressing **Mute**, **V**, **I**, **E**, **W, #** on the keypad and then pressing ***** until the model number appears. Press # to exit.

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Examples of model numbers are “4612D01A-003” (Gen-1) and 4612D02A-003 (Gen-2).

The powering tests included verification of the following after the product was connected to the switch:

- Successful boot operation
- For IP telephones, successful registration with an Avaya Media Server/Gateway and completion of a test call
- For wireless LAN access points, successful registration of a wireless laptop and use of the administration web interface for the access point from the laptop.

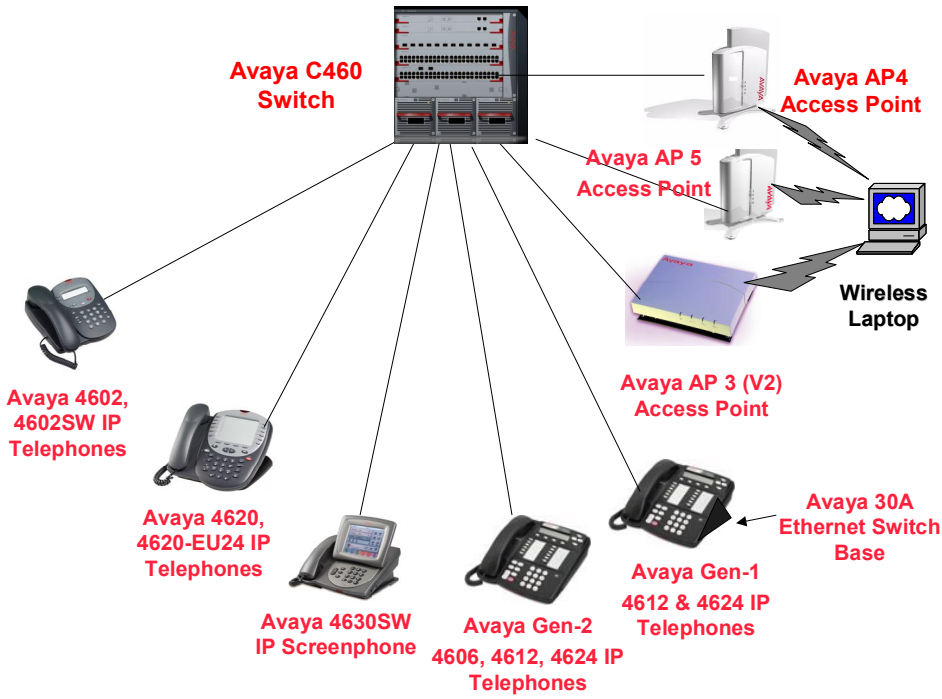

Figure 1: Avaya 4600 Series IP Telephone and Wireless Access Point Configurations with the Avaya C460 Switch

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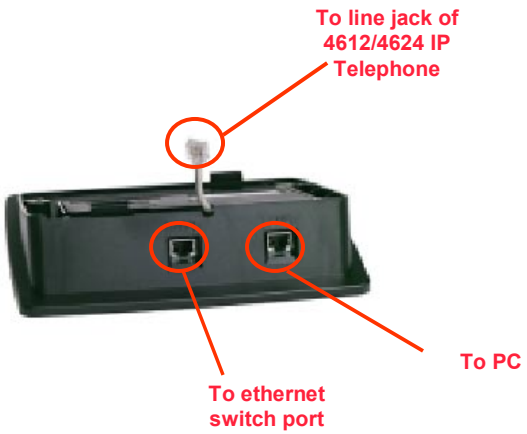

Figure 2: Avaya 30A Switch Base Connections

2. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software
Avaya™ 4602 IP Telephone	1.7
Avaya™ 4602SW IP Telephone	1.7
Avaya™ 4620 IP Telephone with EU24 Button Expansion Module	1.794
Avaya™ 4630SW IP Screenphone	1.8
Avaya™ 4606 IP Telephone (Gen-2)	1.73
Avaya™ 4612 IP Telephone (Gen-1, Gen-2)	1.73
Avaya™ 4624 IP Telephone (Gen-1)	1.73
Avaya™ 4624 IP Telephone (Gen-2)	1.8
Avaya™ AP-3 Access Point (v2 model)	2.1.2(412)
Avaya™ AP-4 Access Point	2.1.1(403)
Avaya™ AP-5 Access Point	2.1.1(375)
Avaya™ 30A Ethernet Switch Base	-
Avaya™ C460 Converged Multilayer Switch	2.0.2

3. Configure Inline Power on the C460 Switch

The CLI commands applicable to inline powering configuration are:

- **set port powerinline** – used to enable/disable the load detection and power delivery on a port. The default is **enabled**.

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- **set port powerinline priority** – used to set the priority of the port to be powered to **Low**, **High** or **Critical**. The default is **Low**.
- **set powerinline budget** – used to force the supervisor module to recalculate and to reapply the PoE budget to the I/O modules. This command may reset the switch.

Steps	Description

1.	• Enable PoE on port 6/1.
	
	`C460-2(configure)# set port powerinline 6/1 enable`
	`Load detection process on port 6/1 is enabled.`

2.	• Set port 6/1 inline power priority to high.
	
	`C460-2(configure)# set port powerinline priority 6/1 high`
	`Powering priority on port 6/1 was set to High.`

3.	• Recalculate and reapply Main and PoE power budget.
	
	`C460-2(configure)# set powerinline budget`
	`This command may RESET the device`
	`*** May cause reset *** - do you want to continue (Y/N)? y`
	
	`The power budget in the chassis was redistributed.`

4. Verification Steps

The CLI commands applicable to verify inline powering status are:

- **show powerinline** – used to display the current state of the inline power.
- **show powerinline budget** – used to display the PoE budget distribution for modules in the switch
- **show environment power** – used to provide PoE information.

Steps	Description

1.	• Display the inline power status.
	
	`C460-2(super)# show powerinline`
	`Port  Admin  Detection  Maintenance  Powering`
	`  Status  Status  Status  Priority`
	`------ -------- ---------- ---------- ---------`
	`6/1  Enabled  Delivering Power  Ok  High`
	`6/2  Enabled  Delivering Power  Ok  Low`
	`6/3  Enabled  Delivering Power  Ok  Low`
	`...`

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Steps	Description

2.	• Display PoE budget distribution.
	• The PoE module M4648ML-T-2G-PWR is located in slot 6. In this example, the PoE budget is 620W for slot 6, of which 20W is currently being used.
	
	`C460-2(super)# show powerinline budget`
	
	`Slot  Module Type                  Budget  Demand`
	`----  --------------------------  ------  ------`
	`   3  M4612ML-G                      N/A     N/A`
	`   4  M4648ML-T-2G                   N/A     N/A`
	`   5`
	`   6  M4648ML-T-2G-PWR              620W     20W`

3.	• Display PoE system information.
	• In this example, the total power drawn from one 1000 W PSU is 1000 W (380W + 620W). The main system (Modules + Fans) gets 380W budget and the PoE module gets 620W budget. Avaya 4620, Avaya AP-3 and AP-5 were connected to ports 6/1-3 respectively. A total of 20 watts have been used for these devices. 600W for the PoE remains. 380 W for the main system have been used:
	
	68W (slot 1: SPV) + 68W (slot 2: SPV) + 59W (slot3: M4612ML-G) + 70W (slot 4: M4648ML-T-2G) + 70W (slot6: M4648ML-T-2G-PWR) + 45W (Fans) = 380 W
	
	`C460-2(super)# show environment power`
	
	`PSUs Configuration Admin: redundancy`
	`PSUs Configuration State: no redundancy (1 active PSU(s))`
	
	`Power  Available  Drawn  Remaining`
	`-----  ---------  -----  ---------`
	`Main        380W   380W          0W`
	`PoE         620W    20W        600W`
	
	`                                                    Main  PoE     PoE`
	`Slot  Module Type       Active  Enabled  Priority  Draw  Budget  Draw  Faul`
	`----  ---------------  ------  -------  --------  ----  ------  ----  ----`
	`   1  M460ML-SPV          Y       Y     critical   68W`
	`   2  M460ML-SPV          Y       Y     critical   68W`
	`   3  M4612ML-G           Y       Y     low        59W`
	`   4  M4648ML-T-2G        Y       Y     low        70W`
	`   5                      N       Y     low         0W`
	`   6  M4648ML-T-2G-PWR    Y       Y     low        70W    620W   20W`
	
	`  * Fans power consumption: 45(W)`

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5. Conclusion

The following Avaya IP telephone and wireless access point products were tested with the Avaya C460 Switch, and were successfully powered:

- IP telephones:
  - 4602 and 4602SW
  - 4620, including EU24 Button Expansion Module
  - 4630SW
  - Gen-1 4612 and 4624 with 30A switch base
  - Gen-2 4606, 4612, and 4624

- Wireless access points
  - AP-3 (v2 model)
  - AP-4
  - AP-5

Avaya IP telephones, Avaya wireless access points, and the Avaya C460 Switch are designed to the IEEE 802.3af standard. These Application Notes have described the interconnection of IP telephones, AP-3 (v2) Access Point, AP-4 Access Point and AP-5 Access Point with the Avaya C460 Switch, as well as status and control commands for the switch.

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